

Homework - June 21
Section 2.5

2. First, solve $L\mathbf{y} = \mathbf{b}$. The augmented matrix is $\begin{bmatrix} 1 & 0 & 0 & 2 \\ -1 & 1 & 0 & -4 \\ 2 & 0 & 1 & 6 \end{bmatrix} \sim \begin{bmatrix} 1 & 0 & 0 & 2 \\ 0 & 1 & 0 & -2 \\ 0 & 0 & 1 & 2 \end{bmatrix}$.

Now, solve $U\mathbf{x} = \mathbf{y}$. The augmented matrix is $\begin{bmatrix} 4 & 3 & 5 & 2 \\ 0 & -2 & 2 & -2 \\ 0 & 0 & 2 & 2 \end{bmatrix} \sim \begin{bmatrix} 4 & 3 & 0 & -3 \\ 0 & -2 & 0 & -4 \\ 0 & 0 & 1 & 1 \end{bmatrix} \sim$

$$\begin{bmatrix} 4 & 0 & 0 & -9 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 1 \end{bmatrix} \sim \begin{bmatrix} 1 & 0 & 0 & -9/4 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 1 \end{bmatrix}. \text{ Thus, } \mathbf{x} = \begin{bmatrix} -9/4 \\ 2 \\ 1 \end{bmatrix}.$$